

Serial No. 09/994,114

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AMENDMENT TO THE CLAIMS

1. (Canceled)
2. (Currently Amended) The method according to Claim [[1]] 21 wherein the input parameters and the value are communicated as at least one of a digital signal and an analog signal.
3. (Currently Amended) The method according to Claim [[1]] 21 wherein the multivariate integration domain is determined by finding an integration area by computing zeros of the integrand.
4. (Currently Amended) The method according to Claim [[1]] 21 wherein the integration points and the integration weights are determined dynamically or adaptively when evaluating the integrand.
5. (Currently Amended) The method according to Claim [[1]] 21 wherein the at least one processor computes the multivariate integration domain as a plurality of partial integrals.

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6. (Currently Amended) The method according to Claim [[1]] 21 wherein the at least one processor computes in parallel at least one of the integration points, the integration weights, the evaluation of the integrand and the combination of the integrand values.

7. (Currently Amended) The method according to Claim [[1]] 21 wherein a dimension of integrals is reduced to accelerate the method.

8. (Currently Amended) The method according to Claim [[1]] 21 wherein at least one second expectation is computed, and the expectation and the at least one second expectation are combined.

9. (Currently Amended) The method according to Claim [[1]] 21 wherein one of a keyboard input and an input device is used to input the input parameters.

10. (Currently Amended) The method according to Claim [[1]] 21 wherein the integrand is evaluated by integrating the integrand.

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11. (Currently Amended) The method according to Claim [[1]] 21 wherein the value of the ~~derivative~~ option is communicated as at least one of a digital signal and an analog signal and the value is displayed on at least one of a monitor and an output device.

12. (Previously Presented) A device for valuation of financial derivatives with options, wherein a value of a derivative with an option is computed by a determination of an expectation, the device comprising:

an input unit communicating a plurality of input parameters of the derivative with the option to a computer;

the computer comprising a setup module establishing an integrand as a function of the input parameters and computing a multivariate integration domain, a discretization module applying a sparse grid method to determine a plurality of integration points and a plurality of integration weights as a function of the input parameters, and an integration module determining an integration domain and evaluating the integrand inside the integration domain at the integration points to determine a plurality of integrand values and computing an expectation by combining the integrand values and the integration weights; and

an output unit communicating a value of the derivative with the option.

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13. (Original) In the device according to Claim 12 wherein the input unit communicates the input parameters and the output unit communicates the value as at least one of a digital signal and an analog signal.

14. (Original) In the device according to Claim 12 wherein the computer comprises at least one processor computing the integration domain as a plurality of partial integrals.

15. (Original) In the device according to Claim 12 wherein the computer comprises a plurality of processors computing in parallel at least one of the integration points, the integration weights, the evaluation of the integrand and the combination of the integrand values.

16. (Original) In the device according to Claim 12 wherein the input unit comprises one of a keyboard input and an input device for inputting the input parameters.

17. (Original) In the device according to Claim 12 wherein the computer communicates the value of the derivative as at least one of a digital signal and an analog signal.

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18. (Original) In the device according to Claim 12 wherein the output unit comprises at least one of a monitor and an output device.

19. (Previously Presented) In the device according to Claim 12 wherein the integration module determines the integration domain by computing discontinuities of the integrand.

20. (Previously Presented) In the device according to Claim 12 wherein the integration module determines the integration domain by finding an integration area by computing zeros of the integrand.

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21. (New) A method for valuation of financial options by a data processor, wherein a value of an option is computed by a determination of an expectation by the data processor, the method comprising:

receiving a plurality of input parameters of the option;

constructing a multivariate integrand as a function of the input parameters;

determining a multivariate integration domain by computing discontinuities of the multivariate integrand;

applying a sparse grid method to determine a plurality of integration points inside the multivariate integration domain and a plurality of integration weights;

evaluating an integrand at each of the integration points to determine a plurality of integrand values;

computing an expectation by combining the integrand values and the integration weights and determining a value of the option from the expectation;
and

outputting the value of the option.